

CHAPTER **7**

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“A collision at sea can ruin your entire day.”

Attributed to Thucydides,

Fifth century B.C. quoted in Heinl

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Areas, Limits, Tracks, and Routes

Introduction and Overview

This chapter addresses *areas, limits, tracks,* and *route information* provided on the nautical chart. “Areas and limits” (referred to in Section N of Chart No. 1) refer to a collection of charting practices (symbols, labels, and notes) used to depict certain areas and limits of importance to the mariner. All these areas have statutory or regulatory significance (e.g., the “three mile limit,” a COLREGS demarcation line, or a designated anchorage), but most also pertain to navigation safety (e.g., a danger area or safety zone). “Track/route” information (referred to in Section M of Chart No. 1) depicted on the nautical chart contains guidance (or regulations) relevant to the selection of routes and/or procedures to be followed for safe navigation. This chapter provides background, summarizes the utility of area/limit/track/route features, describes the charting conventions (e.g., symbols, labels, and notes), identifies other relevant sources of information (e.g., the *U.S. Coast Pilot*), and presents practical pointers on how this information can be used by the prudent mariner.

No attempt has been made to enumerate all areas/limits/tracks/routes depicted on the nautical chart nor to provide an exhaustive discussion of the many legal and policy issues relevant to each. Instead, the chapter focuses upon those features likely to be of greatest potential relevance to the recreational and com-

mercial vessel operator. The omission of any charted feature in this chapter does not relieve the mariner of the responsibility of complying with any applicable regulations.

As noted above, many of the charted features discussed in this chapter have statutory or regulatory significance. This is a chart user’s manual, which provides general information on the charting conventions and the types of regulations that may be applicable to designated areas. It does not purport to give legal advice pertaining to any rules or regulations summarized herein. *Mariners are advised to read carefully the general and specific regulations applicable to these areas. If in doubt, the mariner should seek advice from competent authority or legal counsel.*

Many specialized terms used in this chapter are defined in the Glossary in appendix A. Names enclosed in parentheses (e.g., Bowditch) denote references listed at the end of this chapter that contain additional relevant detail or useful general information. Letter and number designators in the subsection titles and/or text (e.g., N 1.2) refer to sections of Chart No. 1. It is recommended that Chart No. 1 be kept at hand when reading this chapter.

Utility of This Information

In most other chapters of this manual, a separate section is included on the uses of the

information presented. Because of the diversity of the features treated in this chapter, this utility is best discussed on an item-by-item basis. In broad terms, however, this information is charted to alert the mariner to certain dangers to navigation (e.g., danger areas, safety zones) and/or to applicable legal requirements when entering or using these waters.

Federally Regulated Areas (N 1.2, N 2.2, N 31)

Certain waters are subject to general and permanent federal regulations, published in a multi-volume series termed the CFR. The most pertinent portions of the CFR for chart users are Title 33, *Navigation and Navigable Waters*, and Title 40, *Protection of the Environment*. Federally regulated areas include danger areas, seaplane operating areas, seaplane restricted areas, restricted areas, safety zones, defense areas, security zones, and regulated navigation areas (not otherwise classified). Although there are some differences among these areas or zones, it is convenient to discuss these as a group under the broad rubric of *federally regulated areas*.

–Regulated Navigation Areas

A *regulated navigation area* is a water area within a defined boundary for which specific regulations (in addition to the Navigation Rules) have been established. Regulated navigation areas (not otherwise classified) have been established in various areas of the waters of the United States. Regulated areas are established to prevent damage or marine casualties, to protect waterfront facilities, and to safeguard ports, harbors, and the environment. The establishment of these areas is under the jurisdiction of the USCG or the USACE.

The phrase “regulated navigation area” is sometimes used in a more general sense to include all waters for which usage or entry restrictions have been established. In this more general sense, a regulated navigation area is an inclusive term encompassing many of the areas described below.

–Danger Area

According to official charting definitions in the *Desk Reference Guide*, a *danger area...*

“...is a specified area above, below, or within which there may exist potential danger from military, civil, natural or manmade sources. A danger area may be categorized as a prohibited area, exercise area, firing area, or missile test area.”

An *exercise area* (also called a *military practice area*) is an area shown on charts within which troop, ship, or aircraft exercises are carried out. A *missile test area* is an area restricted so that missile range and reliability tests may be conducted by the military. When in use, missile debris may be deposited at frequent and irregular intervals. A *firing area* is a military target area for bombing and/or gunnery practice. A *prohibited area* is a danger area shown on nautical charts within which navigation and/or anchoring is prohibited except as authorized by appropriate authority. Danger areas are typically related to potentially hazardous military activity.

–Seaplane Restricted Areas/Seaplane Operating Areas (N 13, N 14)

As the name implies, seaplane operating areas and seaplane restricted areas refer to designated areas containing seaplane bases. The Inland Navigation Rules normally applicable to seaplane operations are changed in designated *seaplane restricted areas*. Under Rule 18 (Responsibilities Between Vessels), paragraph (d), of the Inland Navigation Rules, which applies to the conduct of vessels in sight of one another, “...a seaplane on the water shall, in general, keep well clear of all vessels and avoid impeding their navigation. In circumstances, however, where risk of collision exists, she shall comply with the Rules of this Part.”

Seaplanes are in “last place” in the normal right-of-way hierarchy. However, seaplane

restricted areas have been established where the conventional right-of-way hierarchy among vessel types described in Rule 18 is altered and/or vessels are prohibited from entering. For example, in the seaplane restricted area described in 33 CFR § 162.15 in Manhasset Bay, NY, the applicable rules (found in 33 CFR or in the *U.S. Coast Pilot*) read: “(1) vessels shall not anchor or moor within the restricted area” and “(2) all vessels traversing the area shall pass directly through without unnecessary delay, and shall give seaplanes the right-of-way at all times.” As a practical matter, seaplanes on the water are not highly maneuverable (they cannot operate in reverse, for example, and “taxiing” or “sailing” a single-engine seaplane is not an easy skill to acquire), a fact recognized in the navigation regulations applicable to seaplane restricted areas.

As the name implies, *seaplane operating areas* are areas frequented by seaplanes. The seaplane operating area designation is typically less restrictive than a seaplane restricted area—warning mariners of the anticipated presence of seaplanes in the area but not necessarily prohibiting entry or anchoring.

Although the number of seaplane operating and restricted areas throughout the country is not large, it is important for the mariner to be aware of the special rules which govern vessel operations in these areas.

–Restricted Area (N 20)

According to official charting definitions in the *Desk Reference Guide*, a *restricted area*...

“...is a specified area designated by an appropriate authority and shown on charts, above, below, or within which navigation is controlled in accordance with certain specified conditions. These control measures are employed to prevent or minimize danger or interference between parties using the area.”

Restricted areas are typically associated with military or other federal (e.g., Federal

Correctional Institutions) installations. Figure 7–1 provides an excerpt from NOS Chart No. 12283 (Annapolis Harbor) which shows, *inter alia*, a restricted area in the vicinity of the U.S. Naval Academy (Anchorage areas shown in this illustration are discussed in a later section of this chapter.).

–Safety Zones/Defense Areas/Security Zones

The *Desk Reference Guide* defines *safety zones*, *defense areas*, and *security zones* as follows:

“A safety zone is a water area and/or shore area to which, for safety or environmental purposes, access is limited to authorized persons, vehicles, or vessels. It may be stationary and described by fixed limits, or it may be described as a zone around a vessel in motion.

“A defense area is a sea area, usually including the approaches to and the waters of important ports, harbors, bays, or sounds, for the control and protection of shipping, for the safeguarding of defense installations bordering on waters of the areas, and for provision of other security measures required within the specified areas. It does not extend seaward beyond the United States territorial waters.

“A security zone is all areas of water which are so designated by the Captain of the Port for such time as he deems necessary to prevent damage or injury to any vessel or waterfront facility, to safeguard ports, harbors, territories, or waters of the United States or to secure the observance of the rights and obligations of the United States.”

Safety zones are defined to minimize safety or environmental hazards associated with non-military activities. For example,

safety zones are typically established around facilities (berths, moorings, gas or oil transfer areas) where hazardous materials, such as *liquefied natural gas* (LNG) or liquefied petroleum gas products, are handled or shipped. Safety zones are also established around certain *Outer Continental Shelf* (OCS) oil and gas operations (see 33 CFR Part 147). Safety zones may be either permanent or temporary—but, for obvious reasons, only permanent safety zones are depicted on NOAA charts.

The purpose of a security zone is to safeguard vessels, harbors, parks, and waterfront facilities from destruction, loss, or injury from sabotage, or other subversive acts, accidents, or other causes of a similar nature. Security zones are generally established around military facilities, such as ammunition depots (e.g., the Naval Ammunition Depot in the vicinity of Sandy Hook Bay, NJ), submarine bases, and submarine construction yards (e.g., the waters of the Thames River near the Electric Boat Division). As with safety zones, security zones may be temporary or permanent—but only permanent security zones are depicted on NOAA charts.

–Relevance to the Mariner

Knowledge of the location, dimensions, and rules and regulations applicable to these areas is important to the mariner for obvious reasons of safety. Being hit by a stray round, torpedoed, or involved in a collision with an LNG tanker is certainly no one's idea of an interesting diversion during an otherwise routine voyage. Moreover, the penalties for unauthorized operations in federally regulated areas can be substantial, including seizure and forfeiture of the vessel, fines, and prison sentences.

–Charting Practices

This section provides information on charting practices and related information for federally regulated areas. Charting conventions consist of a *symbol* and associated *labels and notes*. With few exceptions, NOAA charts show only the type of regulated area, its location, and a CFR section number. Specific regulations applicable to the area are provided elsewhere (e.g., 33 CFR or the *U.S. Coast Pilot*).

–Symbol (e.g., N 1.2, N 2.2, N 31)

Danger area limits are charted with a dashed magenta line. To emphasize the possibility of danger in these areas, a magenta screened band may be added to highlight the dashed limit line.

Seaplane landing areas and seaplane restricted areas (N 13, N 14) are charted with a solid magenta line.

Restricted area limit lines are charted with a T-dashed magenta line.

Safety zone, defense area, and security zone limit lines are charted with a dashed magenta line.¹

A regulated area, not otherwise classified, is depicted by magenta dashed or T-dashed limit lines. Figure 7–2 shows a regulated area (not otherwise classified) in the vicinity of the Chesapeake Bridge Tunnel as shown on NOS Chart No. 12221 (Chesapeake Bay Entrance).

These areas are charted with their exact geographic limits as defined in 33 CFR.

–Labels and Notes

Labels and notes are printed in magenta italic type. Regulated areas are identified on the chart only by the primary title of the area (e.g., labeled “*DANGER AREA*,” “*PROHIB-*

¹Where a defense area, safety zone, or security zone line and the three-mile-limit line coincide, the three-mile line takes precedence. The label is charted along the line.

ITED AREA," "SAFETY ZONE," "DEFENSE AREA," "SECURITY ZONE," "REGULATED AREA," etc.), an alphanumeric designator for the area (if one has been assigned), the CFR section number, and a reference to standard note A (shown below).

For example, referring to the excerpt from NOS Chart No. 13218 (Martha's Vineyard to Block Island) presented in figure 5-3 (refer to Chapter 5), the prohibited area in the vicinity of Nomans Land is labeled as follows:

PROHIBITED AREA
334.70 (see note A)

The number 334.70 refers to the CFR section number which discusses this prohibited area. "Note A," typically found in an uncluttered land area on the chart, contains the standard text,²

"NOTE A

Navigation regulations are published in Chapter 2, U.S. Coast Pilot _____. Additions or revisions to Chapter 2 are published in the Notice to Mariners. Information concerning the regulations may be obtained at the Office of the Commander, ____ Coast Guard District in _____, __, or at the Office of the District Engineer, Corps of Engineers in _____, __."

Blanks in the above note are filled in with the appropriate information.

The regulations applicable to the specific regulated area are always found in Chapter 2 of the indicated volume of the *U. S. Coast Pilot*. (Except when specifically requested by appropriate authority, these regulations are *not* shown on the nautical chart, however.)

-Examples

Here is an excerpt from the text describing the *prohibited area* described in Section 334.70 of 33 CFR as contained in *U.S. Coast Pilot Volume 2 (1993) Atlantic Coast: Cape Cod to Sandy Hook*:

" 334.70 Buzzards Bay, and adjacent waters, Mass.; danger zones for naval operations. (a) Atlantic Ocean in vicinity of Nomans Land-(1) The area. The waters surrounding Nomans Land within an area bounded as follows:

[geographic coordinates of area omitted in this citation]

“(2) The regulations. No vessel shall at any time enter or remain within a rectangular portion of the area bounded on the north by a latitude 41° 16'00", on the west by longitude 70° 47' 30", or within the remainder of the area between 1 November and 30 April, inclusive, except by permission of the enforcing agency.

“(3) The regulations in this paragraph shall be enforced by the Commandant, First Naval District, and such agencies as he may designate.”

The textual description in the *U.S. Coast Pilot* provides information on the geographic limits of the area, applicable regulations, and the enforcing agency. The text applicable to this area in the *U.S. Coast Pilot* is relatively brief. Entries for other areas are often more detailed and may run to several pages. However, the above excerpt illustrates the general format.

Many of the areas discussed in this section have *general* as well as *specific* regula-

²On NOAA charts, Note A is reserved for the note listing the publications that contain navigation regulations relevant to that chart; other charted notes begin with Note B or some other reference label *even if there is no Note A on that chart*.

tions that apply. For example, the general regulations pertaining to a *safety zone* are found in 33 CFR §165.23, shown below:

“Unless otherwise provided in this part:

“a. No person may enter a safety zone unless authorized by the COTP [Captain of the Port] or the District Commander [USCG];

“b. No person may bring or cause to be brought into a safety zone any vehicle, vessel, or object unless authorized by the COTP or the District Commander;

“c. No person may remain in a safety zone or allow any vehicle, vessel, or object to remain in a safety zone unless authorized by the COTP or the District Commander; and

“d. Each person in a safety zone who has notice of a lawful order or direction shall obey the order or direction of the COTP or District Commander issued to carry out the purposes of this subpart.”

Specific regulations may amend or extend the above general regulations, and are found in the CFR (or *U.S. Coast Pilot*) in a separate section. Mariners need to consult both specific and general regulations.

As an example of specific rules pertaining to a *safety zone*, consider this entry from the *U.S. Coast Pilot Volume 3 (1993) Atlantic coast: Sandy Hook to Cape Henry* describing a safety zone located in the Chesapeake Bay:

§165.506 Chesapeake Bay, Hampton Roads, Elizabeth River Southern Branch Liquefied Petroleum Gas Carrier Safety Zone.

“(a) The waters within 250 feet from the port and starboard sides and 300 yards from the bow and stern of a ves-

sel that is carrying liquefied petroleum gas in bulk as cargo are a safety zone while the vessel transits the Chesapeake Bay and Elizabeth River between Thimble Shoal Lighted Buoy #3 and the Atlantic Energy Terminal on the Southern Branch of the Elizabeth River.

“(b) Except as provided in paragraph (c) of this section, the general safety zone regulations in §165.23 [also contained in this volume of the *U.S. Coast Pilot*] apply to the safety zone. Permission to enter the safety zone may be obtained from the Captain of the Port or a designated representative, including the duty officer at the Coast Guard Marine Safety Office, Hampton Roads, or the Coast Guard Patrol Commander.

“(c) A vessel that is moored at a marine, wharf, or pier or is at anchor may remain in the safety zone while a vessel carrying liquefied petroleum gas passes its location if the vessel remains at its moorage or anchorage during the period when its location is within the safety zone.

“(d) A vessel that has had liquefied petroleum gas in a tank is carrying the liquefied petroleum gas in bulk as cargo for the purposes of paragraph (a) of this section, unless the tank has been gas free since the liquefied petroleum gas was last carried as cargo.

“(e) The Captain of the Port, Hampton Roads will issue a Marine Safety Information Broadcast Notice to Mariners to notify the maritime community of the scheduled arrival and departure of a liquefied petroleum gas carrier.”

–Illustrative Regulations

Table 7-1 provides an illustrative list of regulations which may be applicable to various federally regulated areas. In the example of the prohibited area near Nomans Land, entry

Table 7-1.

Illustrative Types of Regulations Applicable to Federally Regulated Areas.

<p>Regulations are area-specific. Consult the current <i>U.S. Coast Pilot</i> for regulations pertaining to each individual area.</p>
<ul style="list-style-type: none"> • Enforcement authority (agency, facility) • Advance notification of restrictions (e.g., published in <i>Notice to Mariners</i>) • Warning signals (e.g., patrol vessels, display of flags, low aircraft passes, etc.) • Outright prohibitions to entry • Requirements for expeditious passage • Requirements to vacate area promptly upon warning • Limits to entry (e.g., during exercise periods, during certain times of day, during certain seasons, etc.) • Minimum separation distances from naval or other designated vessels • Limits to activity (e.g., no loitering, no stopping, no anchoring, no trawling, no fishing, no towing, no docking, no entry onto land, etc.) • Maximum height (e.g., for vessels operating in restricted areas associated with certain coastal airports in circumstances of reduced visibility) • Minimum equipment • Requirements for a pilot on vessels larger than a specified displacement

is prohibited to all but authorized vessels only for specific months of the year. Depending upon the area, the duration of the prohibition may be only for certain times of day, certain days of the year, only when actual exercises or vessel transits are taking place (when the area is said to be “hot”), or at all times. Alternatively, entry may be permitted, but a requirement for expeditious passage, or a requirement to vacate the area promptly upon notification may be imposed.

In the Nomans Land example, entry is forbidden, in other areas entry may be permitted, but limits may be placed upon specific activities of vessels while in the area (e.g., no loitering, no stopping, no anchoring, no trawling, no fishing, no towing, no docking, no entry onto land, etc.). Minimum separation distances (e.g., from naval vessels or carriers of hazardous cargo) may also be mandated in these areas.

In some regulated areas (e.g., that shown in figure 7–1) yet other requirements may be imposed. These include requirements that vessels drawing less than a specified draft

not enter certain channels (unless the vessel is crossing the channel), a prohibition on the entry of vessels above a designated size with impaired maneuverability, technical requirements on tows, requirements for operating radar in vessels above a designated size during periods of reduced visibility, and requirements for pilots with local knowledge aboard vessels greater than a certain size (e.g., 100 gross tons).

Finally, the height of vessels permitted to operate in the regulated area may be limited. The height constraint is applicable in certain restricted areas associated with some coastal airports and is intended to lower the risk of collision with low-flying aircraft and reduce the possibility of interference with navigational equipment. For example, in the restricted area (33 CFR § 162.20) contiguous to La Guardia Airport, Flushing, NY, no vessels with a height greater than 35 feet may enter whenever the prevailing visibility is less than 1 mile.

In cases where entry is prohibited only during times when the area is being used, the

U.S. Coast Pilot will indicate how notification is given, either in advance (e.g., in the *Notice to Mariners*), or shortly before the activity commences (e.g., by display of warning flags, the presence of patrol vessels, low aircraft passes, etc.).

–Summary

It is a surprisingly common misconception that federally regulated areas cannot be entered at any time. In fact, many of these areas are not denied (or at least not denied at all times) and these areas can be safely used if the prescribed regulations are followed. The mariner should consult 33 CFR or the *U.S. Coast Pilot* to determine the restrictions to entry and other pertinent regulations. *However, unless the specific regulations are consulted (e.g., as found in 33 CFR or the U.S. Coast Pilot), the prudent mariner has no alternative but to remain well clear of federally regulated areas.* Do not radio the USCG with a request for real-time information on navigation regulations applicable to, or the status of, these areas. Not all USCG units have this information readily available. The USCG will respond to written or telephone inquiries, but does not necessarily offer “real time” response.

Civil Reservations

Civil reservations include a variety of non-military areas such as state and national parks, reservations, wildlife preserves, wildlife refuges, marine sanctuaries, Indian reservations, and similar specially designated areas. Generally, reservation areas are charted only if requested by the cognizant agency. With certain exceptions, these areas provide interesting background rather than information relevant to navigation. (These areas are charted in blue, as noted below, so as to reserve the use of magenta and black for charting features that are of greater navigational importance to the mariner.) Mariners are advised, however, to consult the CFR and other sources for any regulations applicable to these areas.

As an illustration of one type of civil reservation, figure 7–3 provides an excerpt from

NOS Chart No. 12274 (Head of Chesapeake Bay) which shows, *inter alia*, a portion of the Susquehanna National Wildlife Refuge. Applicable rules for operating in wildlife refuges and other regulations are given in 50 CFR Parts 25, 27, and 32. These regulations include the Navigation Rules, state regulations, and several additional regulations. The additional regulations include a prohibition on leaving boats (outside of designated mooring or beaching areas) unattended for a period greater than 72 hours without the permission of the refuge manager, a ban on use of government-owned docks for loading and unloading of boats (except in emergency), special rules for water skiing, regulations applicable to marine sanitation devices, and a variety of special rules which limit or prohibit hunting and fishing activities. Some wildlife refuge regulations are site specific.

–Charting Practices

This section provides information on charting practices and related information for civil reservations. Charting conventions consist of a *symbol* and associated *labels* and *notes*.

–Symbol (N 22)

Civil reservations are charted with a blue long-short dashed line. A more prominent blue screened band may be added to the inside edge of the entire outline if needed to avoid confusion. For example, where different reservations overlap, the screened band may be used to denote the reservation(s) of greater importance.

–Labels and Notes

Labels and notes are printed in blue type. If the boundary is chiefly in the water, italic type is used; if chiefly on land, conventional type is used. The label type should be consistent on overlapping charts. The label consists of the *name* of the reservation (e.g., “*SUSQUEHANNA NATIONAL WILDLIFE REFUGE*”) in italic capitals and a *description* (e.g., “*protected area*”) in lower case italic type if appropriate. The label “see note A” is included only when the cited federal regulations are given in the *U.S. Coast Pilot*. Where ref-

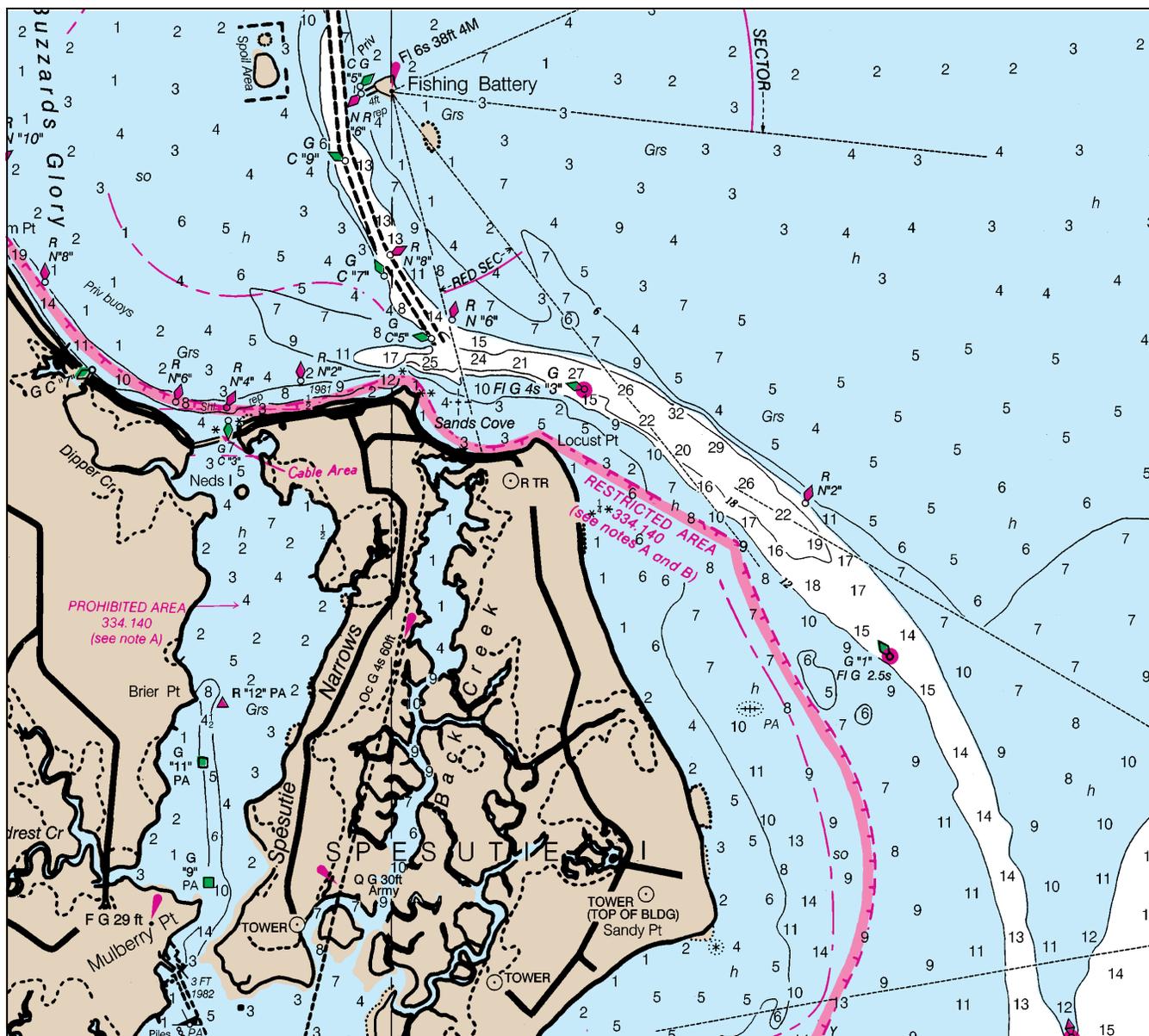


Fig. 7-3. Excerpt from NOS Chart No. 12274 (head of Chesapeake Bay) showing a restricted area and portion of Susquehanna National Wildlife Refuge.

reference to note A is not appropriate, the label may refer to another note or the CFR.

-Relevance to the Mariner

Generally speaking, civil reservations are of only limited interest to the mariner. This is reflected in the choice of color for their depiction on the nautical chart. Nonetheless, these features are charted to alert the mariner to possible regulations which may affect entry and/or limit activities.

The *U.S. Coast Pilot* provides relevant in-

formation for some, but not all, of these areas. Mariners interested in using these waters should consult appreciable sections of the CFR. (Refer to the CFR Index to find the appropriate section(s).)

Federally Regulated Anchorage Areas/ Grounds

Federally regulated anchorage areas and grounds are important features depicted on NOAA charts. It is convenient to group federally regulated anchorage areas into three

broad classes: (i) anchorage grounds, (ii) special anchorage areas, and (iii) fairway anchorages. These are discussed below.

–Anchorage Grounds

The USCG is authorized (under Section 7 of the River and Harbor Act of March 4, 1915) to define and establish anchorage grounds for vessels “whenever it is apparent that these are required by the maritime or commercial interests of the United States for safe navigation.” Further, the USCG is authorized to establish rules and regulations applicable to these designated anchorage grounds.

Several types of anchorage grounds have been established by the USCG, including (but not limited to) general anchorages, commercial anchorages, deep-draft anchorages, small-craft anchorages, special anchorages, quarantine anchorages, temporary anchorages, deadship anchorages, explosive anchorages, forbidden anchorages, nonanchorage grounds, and restricted anchorages. For the most part, terms used to describe these anchorage grounds (e.g., commercial anchorages) are *not defined explicitly in the CFR*. Rather, the definitions are implicit and made clear by the specific rules and regulations pertaining to each designated anchorage. For example, a *dead-ship anchorage* is designed to lay up ships for extended periods, a *quarantine anchorage* is designed to accommodate ships requesting quarantine inspection, a *deep-draft anchorage* is designed principally for deep-draft ships. Forbidden, prohibited, nonanchorages, and restricted anchorages all have regulations which limit or prohibit anchoring by various types of vessels, or require special authorization for anchoring. A description of these designated anchorage grounds and the regulations applicable to each can be found in the CFR and the *U.S. Coast Pilot*.

Anchoring berths are usually circular areas located within certain established anchorage grounds as a convenience in assigning anchoring locations for both military and commercial vessels. Information concerning an-

choring berths may be published in the CFR (and *U.S. Coast Pilot*), but may also be developed by local users and available from the originator.

–Special Anchorage Areas

An Act of Congress of April 22, 1940, provided for the designation of *special anchorage areas* wherein vessels not more than 65 feet in length, when at anchor, are not required to carry or exhibit anchor lights. These special anchorage areas (33 CFR § 109.10) are “well removed from fairways³ and located where general navigation will not endanger or be endangered by unlighted vessels.” Special anchorage areas are established for the convenience of small (typically recreational) vessels.

–Fairway Anchorages

According to 33 CFR § 166.105, “*shipping safety fairway* means a lane or corridor in which no artificial island or fixed structure, whether temporary or permanent, will be permitted.” These fairways are established to control the erection or structures so as to provide safe approaches through: (i) oil fields in the Gulf of Mexico to entrances to the major ports along the gulf coast (33 CFR § 166.200), (ii) the coast of California (33 CFR § 166.300), (iii) the coast of Alaska (33 CFR § 166.400), and (iv) the Atlantic coast (33 CFR § 166.500). A *fairway anchorage* “means an anchorage area contiguous to and associated with a fairway, in which fixed structures may be permitted within certain spacing limitations.”

–Relevance to the Mariner

Knowledge of the presence and location of designated anchorage grounds/areas are relevant to the mariner for two principal reasons:

First, and perhaps most important, charting these areas serves to inform the mariner that various rules and regulations may apply to each designated area. (Sources for these regulations are identified below.) Table 7–2

³Shipping safety fairways are also charted.

provides a sampling of some of the types of rules that may apply to any of these areas. In brief, there may be outright prohibitions on anchoring, limits on the type, number, or duration of stay of vessels in an anchorage, limits or prohibitions on certain activities within an anchorage (e.g., no lightering or fishing), requirements to plot position and/or maintain a communications guard, notification requirements, and technological requirements (e.g., use of multiple anchors, requirements to have tugs present, etc.). Not all of the restrictions identified in table 7-2 are

applicable to each anchorage, but each of the rules are applicable to some of these areas. Failure to follow the rules could entail significant operating risks, and may involve legal penalties as well.

Second, designated anchorage grounds should alert the mariner to areas where anchored vessels may be encountered. Therefore, these areas are generally to be avoided, except by vessels intending to use the anchorage. (By design, these designated anchorage areas are not located in main channels, so avoidance is not particu-

Table 7-2
Illustrative Regulations That May Pertain to Designated Anchorages

Regulations are anchorage-specific; not all anchorages will have each of the illustrative regulations given. The current *U.S. Coast Pilot* should be consulted to find the specific regulations applicable to each designated anchorage.

- Controlling authority and permit requirements
- Limits to type of vessel (e.g., recreational, commercial, naval, (submarines, aircraft carriers, destroyers, etc.) explosives, vessels under the custody of the United States, dead ships)
- Maximum or minimum length and/or draft of vessel
- Priority among vessels (e.g., priorities accorded naval vessels, commercial vessels, or vessels awaiting quarantine inspection, etc.)
- Freedom from requirements to display anchor lights (for vessels less than 65 feet long in designated special anchorages)
- Conditions of use (e.g., during emergencies only)
- Limits on navigation, transit speeds, or on certain activities (e.g., fishing, lightering, etc.)
- Cargo restrictions
- Limits on the number of vessels that can use an anchorage
- Prohibition of certain types of vessels (e.g., fishing vessels, vessels being dismantled)
- Minimum distances among anchored ships
- Limits on placement of anchors and requirements for multiple anchors
- Permission or limits on placement of moorings, floats, or buoys
- Notification Requirements (e.g., when anchoring, and prior to engaging in certain operations, or getting underway)
- Maximum time to get underway (e.g., "warm start" capability, prohibition on "dead" ships, or requirement that "dead" ships have tugs alongside)
- Requirements to maintain a communications guard and/or to plot position
- Requirements for wooden ships to have radar reflectors aboard
- Prohibitions on use by unseaworthy ships
- Time limits (e.g., 24-hours, 48-hours, 30-days)

larly burdensome.) In special anchorage areas, vessels less than 65 feet in length are not required to display anchor lights, which means that vessels transiting these areas at night are well advised to exert special vigilance to avoid possible collisions with unlighted vessels at anchor.

–Charting Practices

This section provides information on charting practices and related information for federally regulated anchorages. Charting conventions consist of a *symbol* and associated *labels* and *notes*. With few exceptions, NOAA charts show only the type of anchorage, its location, and a CFR section number. Specific regulations applicable to the area are provided elsewhere (e.g., 33 CFR or the *U.S. Coast Pilot*).

–Symbol (e.g., N 11.1 - N 20)

Federally regulated anchorages are depicted by magenta limit lines which show the exact geographic boundaries of the anchorage. The line thickness and whether or not it is solid or dashed varies with the type of anchorage, as shown in table 7–3. A magenta screen may be added for emphasis.

Anchoring berths (N 11.1, N 11.2) are charted as solid or dashed circles of specified diameter with a small center-position circle (solid or dashed to correspond the berth limit symbol) and a designator. Circles and designators may be shown in magenta or a screened green. (If another color is required for clarity, berths may be printed in black.)

Figure 7–4 provides an excerpt from NOS Chart No. 12221 (Chesapeake Bay Entrance) showing two naval anchorages, a commercial explosive anchorage, and an anchorage berth.

–Label

The charted anchorage area is identified with a magenta label in italic type that includes the primary title of the area as given in the CFR, an alphanumeric designator (if assigned), the CFR section number, and a ref-

erence to the standard note A discussed earlier in this chapter. Examples include:

SPECIAL ANCHORAGE
110.1, 110.126a (see note A)
COMMERCIAL EXPLOSIVE ANCHORAGE
110.168 (see note A)
FAIRWAY ANCHORAGE
166.200 (see note A)

Bottom characteristics (see Chapter 4) are depicted in designated anchorage areas and other areas where vessels are expected to anchor.

–Notes

Anchorage areas also refer to the standard note A. This note directs the mariner to the appropriate section of the *U.S. Coast Pilot*. Applicable regulations can be found in either the CFR or the *U.S. Coast Pilot*. Regulations may consist of both *specific* regulations applicable to the designated anchorage area and *general* regulations (i.e., common regulations applicable to several anchorages in the same area). For example, there are numerous general regulations applicable to Anchorage E shown in figure 7–4. But there are additional specific regulations given in the CFR and the *U.S. Coast Pilot*. The specific regulations (33 CFR § 110.168) include:

“(4) Anchorage E. (i) A vessel may not anchor in Anchorage E without a permit issued by the Captain of the Port.

“(ii) The Captain of the Port shall give commercial vessels priority over naval and public vessels.

“(iii) The Captain of the Port may at any time revoke a permit to anchor in Anchorage E issued under the authority of paragraph (f)(4)(i) of this section.

“(iv) A vessel may not anchor in Anchorage Berth E-1 unless it is carrying or handling dangerous cargo or military explosives.

Table 7-3.
Charting Symbols for Federally Regulated Anchorages

Type of Anchorage	Subtype (if defined)	Charting Symbol
Commercial anchorage	N/A	0.2 mm solid magenta line; anchoring berths may also be shown
Dead-ship anchorage ^a	N/A	
Deep-draft anchorage	N/A	
General anchorage	N/A	
Military anchorage	Naval ^b Naval and General	
Small-craft anchorage	N/A	
Special anchorage	N/A	
Temporary anchorage	N/A	
Explosive anchorage	Commercial explosive Emergency explosive Naval explosive Temporary explosive	
Forbidden anchorage	N/A	
Prohibited anchorage	N/A	
Nonanchorage	N/A	
Quarantine anchorage	N/A	
Restricted anchorage	N/A	
Fairway anchorage	N/A	0.5 mm solid magenta line; anchoring berths may also be shown

SOURCE: Adapted from information given in the *Nautical Chart Manual*

NOTES:

^a See: e.g., 33 CFR § 110.158.

^b Some naval anchorages are further subdivided into submarine anchorages (33 CFR § 110.150), aircraft carriers, destroyers (33 CFR § 110.182), small craft (33 CFR § 110.159), or emergency naval anchorages (33 CFR § 110.155).

“(v) A vessel may not anchor within 500 yards of Anchorage Berth E-1 without the permission of the Captain of the Port, if the berth is occupied by a vessel carrying or handling dangerous cargo or military explosives.”

Nonfederally Regulated Anchorages (N 12.1)

State and local governments may establish anchorages in waters under their jurisdiction. These areas may also be charted at the discretion of NOAA. Chart conventions

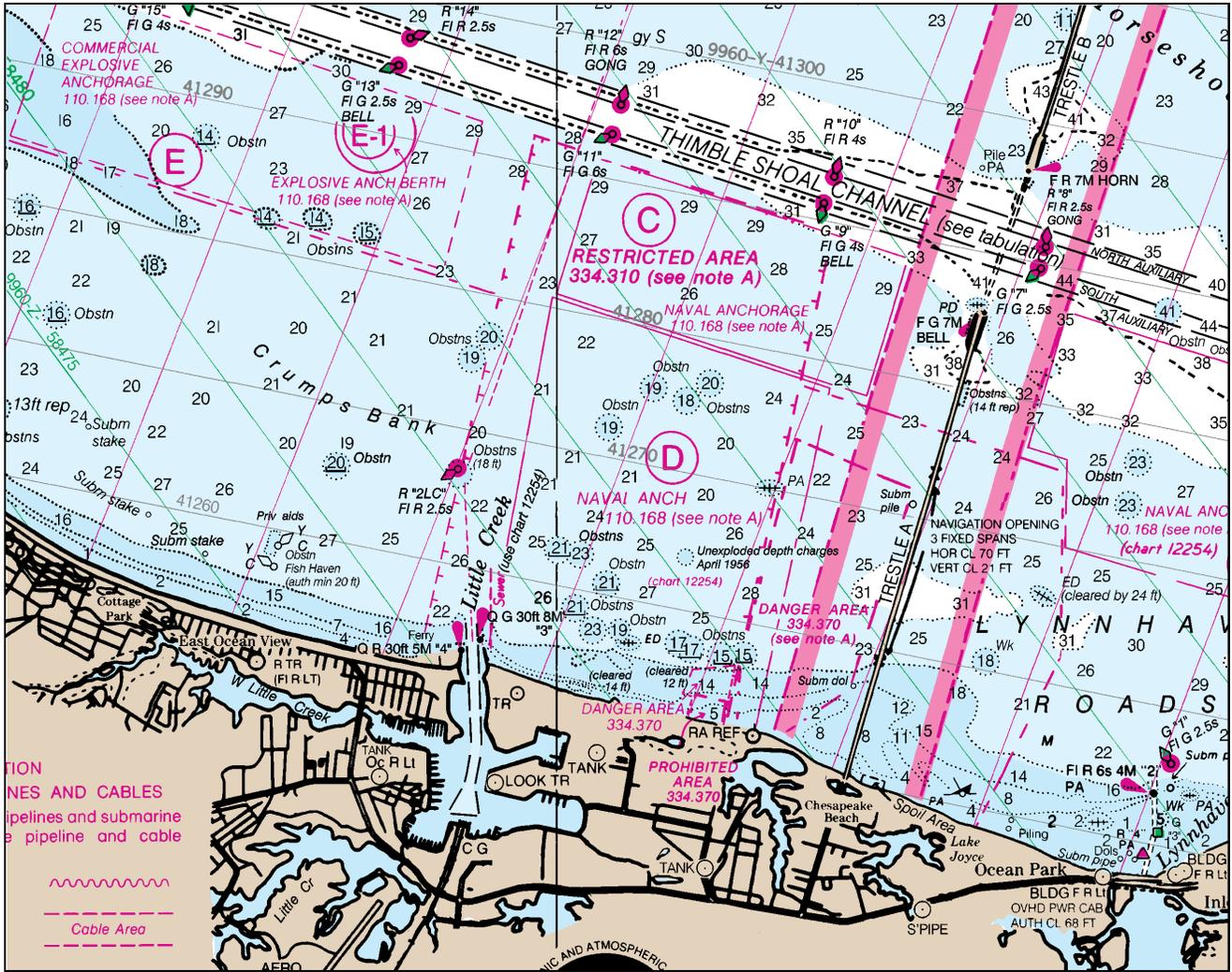


Fig. 7-4. Excerpt from NOS Chart No. 12221 (Chesapeake Bay Entrance) showing a variety of anchorages and berths along with other features of interest.

parallel those for federally regulated anchorages, except that a black dashed line is used rather than a magenta line. Applicable rules and regulations for these areas are not published in the *U.S. Coast Pilot*, but must be obtained by the agency having jurisdiction over the anchorage area.

Harbors of Refuge (N 10)

Harbors of Refuge are recognized anchorage areas without defined limits. These harbors provide passing vessels with good holding ground and temporary refuge from storms. For this reason, vessel operations (particularly operators of small vessels) should be familiar with the location of the

various Harbors of Refuge along a proposed route. A harbor of refuge may or may not be considered a part of a shipping port. A harbor of refuge is identified with a black anchor symbol (N 10) and a label *"HARBOR OF REFUGE"* in black italic capital letters.

Dumping/Disposal Areas

Dumping/disposal areas have been established for various purposes, such as for ocean dumping of toxic wastes (now prohibited) or depositing dredged materials. These areas may constitute hazards to navigation and are charted for this reason. Three general classes (determined by the federal regulatory authority that has jurisdiction over their establish-

ment) of dumping areas are shown on NOAA charts. These are briefly described below.

-EPA-Established Dumping Areas (N 24, N c, N d, N g)

The U.S. *Environmental Protection Agency* (EPA) established ocean dumping sites (40 CFR Part 227) for the purpose of disposing of toxic and nontoxic materials including dredged material, industrial waste, acid waste, municipal waste, sludge, etc. These areas are charted in all cases where hydrography and other navigational detail are shown in the area.⁴

Dumping areas designated in 40 CFR § 228.12 are shown by a black dashed limit line. A label is added in black to identify the area in italic type, capital and lowercase letters, in a size appropriate to the charted feature. A label refers to note S. A descriptive term such as “dredged material” may be added to the label to reflect the primary use of the area as identified in the regulations. Examples include:

Dump Site
(see note S)
Dump Site
(dredged material)
(see note S)

Note S is charted in the vicinity of note A and states:

“NOTE S

Regulations for Ocean Dumping Sites are contained in 40 CFR, Parts 220-229. Additional information concerning the regulations and requirements for use of the sites may be obtained from Environmental Protection Agency...”

Hydrography and tints (see Chapter 4)

are retained in the dumping areas because these areas are not intended to interfere with navigation. The date of the hydrography is stated as follows:

“Depths from survey of _____”

On small-scale charts, the dimensions of the dump site may preclude its being charted to scale. In this event, a minimum-size symbol (a 2.0 mm dashed square) is used in lieu of attempting to depict the actual size. If this symbol is used for all dump sites shown on a particular chart, these are identified by label, without reference to note S, e.g.:

Dump Site
(dredged material).

-Navy-Established Dumping Areas

The Navy designated certain areas, generally in deep water at a considerable distance offshore, for disposal of ammunition, chemicals, and explosives. These areas are shown on NOAA charts to inform chart users, notably trawlers, who might tangle with dangerous materials. The same chart conventions are used as for Environmental Protection Agency (EPA)-established dumping areas.

-U.S. Army Corps of Engineers Areas

The USACE has authority to establish dumping areas with the approval of EPA. These dumping areas are classified variously as *spoil areas*, *disposal areas*, or *dumping grounds*. The following note is added in black to all charts containing spoil areas, disposal areas, and dumping grounds where dumping is regulated by this agency:

⁴Refer to Chapter 4 for information on areas where hydrography is omitted.

“DUMPING CAUTION

Dumping dredged or fill materials in spoil areas, disposal areas, and dumping grounds is illegal without authorization from the U.S. Army Corps of Engineers. Regulations and permission for dumping in area (or areas) charted, may be obtained at the office of the District Engineer, Corps of Engineers, New Orleans, Louisiana.”

Spoil areas (N 62.1) are established for the disposal of dredged material removed from the bottom of channels and harbors during dredging operations. If inactive, the area is still charted, but labeled in black italic capital and lower-case letters, “*Discontinued Spoil Area.*” These areas are generally located near and parallel to the dredged channel and are potentially dangerous to navigation. Active spoil area limits are shown by a black dashed line delineating the extent of the area, a label (in italic, capital and lowercase letters) “*Spoil Area,*” with blue tint No. 1 added to accentuate their potentially dangerous nature. Spoil areas that uncover are tinted green. Soundings and depth curves (see Chapter 4) are omitted within spoil areas, although islets and areas bare at MLLW are charted.

Disposal areas (N d) are established or approved (see 33 CFR Parts 323-324) for depositing dredged material in waters where existing depths and currents indicate that the dumping will not cause sufficient shoaling to create a danger to surface navigation. Disposal area limits are shown by a black dashed line, except that soundings, tints, and depth curves are retained inside the limits of these areas. The following note is shown in italic type:

*“Disposal Area
Depths from survey of _____”*

–Dumping Grounds (N c)

Dumping grounds are areas formerly designated by the USACE (under 33 CFR Part

205, now revoked) for dumping (by permit) various types of materials. These dumping grounds are typically located well offshore in deep water.

Dumping ground area limits are shown by a black dashed line. Soundings and depth curves may be charted within the limits. A blue tint is added when justified by the charted hydrography (see Chapter 4). Finally, the label “*Dumping Ground*” in black italic type (capital and lower-case letters) is added inside the limits of the area.

–Relevance to the Mariner

Generally speaking, these areas are depicted on nautical charts to alert the mariner to the possibility of danger when transiting the area (e.g., spoil areas) or when engaging in certain activities (e.g., trawling in the vicinity of Navy-established dumping areas). Depiction of these areas on the nautical chart also serves to alert the mariner to the types of vessels that may frequent these areas. A spoil area, for example, might be frequented by dredges, tugs, and barges.

Spoil areas are of particular concern, because of their generally shallow depths and proximity to dredged channels. There are numerous instances of vessels running aground in these spoil areas. Avoidance is the safest course of action lest they spoil your voyage in more ways than one.

–Illustration

Figure 7–5 shows an excerpt from NOS Chart No. 11361 (Mississippi River Delta) showing the Southwest Pass at the mouth of the Mississippi River. Several features of this chart excerpt are of interest. Note the oil platforms, oil pipelines, and the safety fairway for vessels entering and existing the Southwest Pass. Note also the blue tinted spoil area on either side of the channel. The blue tint alerts mariners to the danger posed by these areas. See also the dump site to the west of the channel. The northern portion of the dump site overlays the spoil area. The cartographer elected to tint the entire dump site area blue, to emphasize the possible dangers in this area.

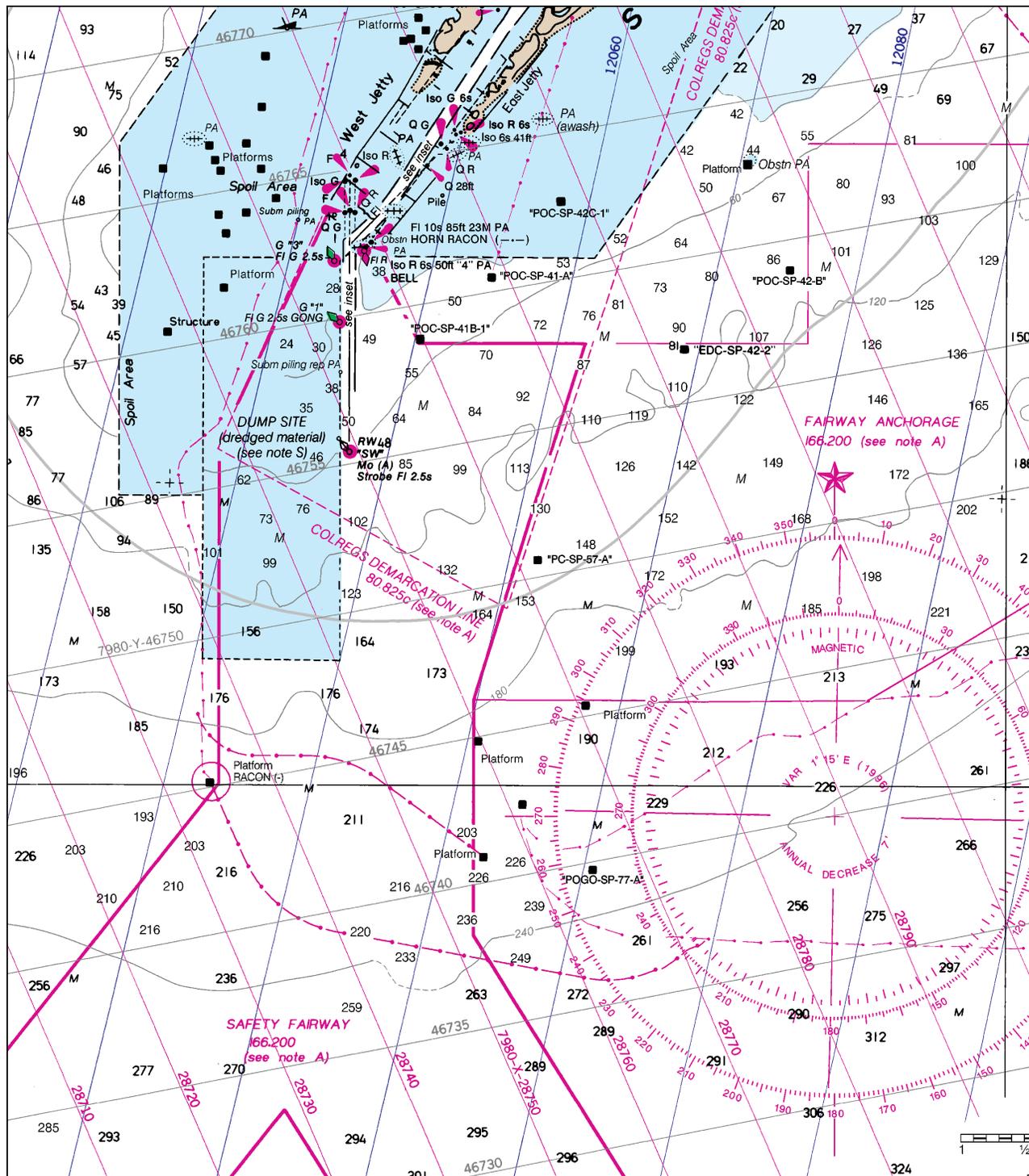


Fig. 7-5. Excerpt from NOS Chart No. 11361 (Mississippi River Delta)

However, soundings south of the southern boundary of the original spoil area were retained, as these were judged unlikely to change materially as a result of the dumping activities. This area was the site of a collision between a northbound Dutch cruise ship *Noordham* and a southbound freighter *Mt. Ymitos* in November of 1993 (see *Professional Mariner*, Issue No. 5). The accident investigation is still pending as of this writing, so it would be premature to speculate on the cause of the accident. However, one aspect of this collision is of interest here. The Captain of the southbound *Mt. Ymitos* reportedly claimed that he could not alter course to the right (i.e., westward) because of the proximity of the dump site. Moving westward of the buoyed channel when north of the fairway buoy "SW" would entail some risk of grounding. For positions south of this buoy, the soundings and the included 120-foot depth curve shown on the chart offer more comfort. Presumably, any vessel of sufficient draft to be accommodated in the channel (40 feet) could transit this area without appreciable risk of grounding.

COLREGS Demarcation Line (N a)

A COLREGS demarcation line (see 33 CFR Part 80) divides U.S. waters into two areas. Landward of this line the Inland Navigation Rules apply, seaward of this line the International Navigation Rules apply. (The USCG publishes both sets of rules in COMDTINST M16672.2B, see references.) Although many of the navigation rules are common to both sets, some differ. For example, required lights and whistle signals under the inland rules differ from those under the international rules. For this reason it is important that the mariner be aware of the water areas where each set of navigation rules apply. The COLREGS demarcation lines are published in CFR and in COMDTINST M16672.2B in terms of the latitude and longitude of linear seg-

ments, but these coordinates are not convenient for use. For this reason, the COLREGS demarcation lines are printed on NOAA charts.

-Charting Practices

Charting conventions for COLREGS demarcation lines consist of a symbol, label, and note, as discussed below.

-Symbol (N a)

COLREGS demarcation lines are shown on all coastal series charts (scale 1:150,000 and larger) and on other charts as needed using a magenta dashed line (N a).

-Label

The label "*COLREGS DEMARCATION LINE*" in magenta italic capital letters (see figure 7-2 or figure 7-5) is placed along the line, either inside or outside as space permits. If labels cannot be placed along the COLREGS line, these may be placed on land and parallel to the chart base. Labels in other locations (where space is limited) where labeling may be critical are abbreviated "*COLREGS.*" This abbreviated label may be omitted in cases where the labels would be extremely close together or where several chart lines are in close proximity.

Some charts depict only areas where the international rules apply. This includes certain areas of New England, Florida, Puerto Rico, the Aleutians, and other areas. The following note is added to these charts in lieu of the addition to the Symbols and Abbreviations note:

*"COLREGS, 80.____ (see note A)
International Regulations for Preventing
Collisions at Sea, 1972"*

In areas where COLREGS lines are shown and space permits, the second line of the label shows the CFR section number and the reference to note A, e.g., "*80.325a (see note A).*"

Degaussing Range (N 25)⁵

A degaussing (demagnetizing) range is an area within which a vessel's magnetic field may be measured. These measurements are used to determine the required degaussing coil current settings and other corrective action(s). Sensing instruments and cables are installed on the sea bed in the range, with the cables leading from the range to a control position ashore. This range is usually marked by distinctive buoys identifying the purpose of the range. Although there are relatively few degaussing ranges, their presence and location are relevant to the mariner because of the specific rules and regulations that may apply therein. These include (but are not limited to) a prohibition on the introduction of external magnetic field sources, anchoring, trawling, and a requirement to avoid the range when it is in use. For an interesting article on the use of the degaussing range, see Ryan.

The limits of the degaussing range are shown by a dashed line (N 25). Submarine cables extending from the shore are charted in their exact position and shown in magenta. The label "*DEGAUSSING RANGE*" is shown in black capital italic letters in a type size appropriate to the feature.

Maritime Boundaries

There are numerous maritime boundaries (e.g., the Three Mile Line) referred to in state or federal laws. (A description of the provisions of the various laws having maritime boundaries is beyond the scope of this manual. The reader is referred to other sources for this information.) The shoreline and the low-water line are used as "baselines" for determining the various maritime boundaries described by geographic coordinates in legal references. The nautical chart is the legal graphic authority for most of these boundaries.

Maritime boundaries reference to the low-water line that are found on NOAA charts include the following:

Exclusive Economic Zone (200 nautical miles)
Magnuson Fishery Conservation and Management Act Amendments (Alaska fishing limits)
Marine Sanctuaries
National Parks
National Seashores
Natural Resources Boundary (3 leagues or 9 nautical miles; Texas, Florida-Gulf of Mexico coast, Puerto Rico)
Political Boundaries
Territorial Sea and Contiguous Zone (12 miles)
Three Nautical Mile Line
State Parks.

Some of the more important of these boundaries are explained below.

-International Boundaries (N 40, N 41)

International boundaries are charted with a solid black crossed dashed line (N 40, N 41).

-Exclusive Economic Zone (N 47)

In 1983, a 200-mile *Exclusive Economic Zone* (EEZ) was established. This zone is described in the *Coast Pilot Manual* as follows:

"...the EEZ of the United States is a zone contiguous to the Territorial Sea and Contiguous Zone (12 nautical miles) of the United States, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Mariana Islands (to the extent consistent with the Covenant the United Nations Trusteeship Agreement), and the United States overseas territories and possessions. The EEZ extends to a distance 200 nautical miles from the baseline from which the breadth of the territorial sea is measured..."

⁵Some degaussing ranges (e.g., 33 CFR § 334.870) are also restricted areas.

The significance of this zone is described in the *Coast Pilot Manual* as follows:

“Within the EEZ, the United States has asserted, to the extent permitted by international law, (a) sovereign rights for the purpose of exploring, exploiting, conserving and managing natural resources, both living and nonliving, of the seabed and subsoil and the superadjacent waters and with regard to other activities for the economic exploitation and exploration of the zone, such as the production of energy from the water, currents and winds; and (b) jurisdiction with regard to the establishment and use of artificial islands, and installations and structures having economic purposes, and the protection and preservation of the marine environment.

“Without prejudice to the sovereign rights and jurisdiction of the United States, the EEZ remains an area beyond the territory and territorial sea of the United States in which all states enjoy the high seas freedoms of navigation, overflight, the laying of submarine cables and pipelines, and other internationally lawful uses of the sea.”

The seaward boundary of the EEZ is coincidental with that of the *Fishery Conservation Zone* (FCZ) over which the United States exercises exclusive fishery management authority over all species of fish, except tuna.

The EEZ limit is shown by a black screened line interspersed at regular limits by a “fish” symbol (N 47). This line is labeled “*EXCLUSIVE ECONOMIC ZONE*” in black italic capital letters.

**–Closing Line/Three Nautical Mile Line/
Territorial Sea and Contiguous Zone
(N 42, N 43, N 44)**

The closing line (baseline) is the dividing line between inland waters and marginal seas across the entrance of a bay. The Three Nautical Mile Line marks the boundary of the waters within a three-mile zone adjacent to the coast and seaward of the closing line. The Territorial Sea and Contiguous Zone marks the boundary of the waters within a 12-nautical mile zone adjacent to the coast and seaward of the closing line.

Each of these lines are black screened unbroken lines of 0.5 mm linewidth. These lines are labeled in black italic type as follows: “*THREE NAUTICAL MILE (see note X),*” “*TERRITORIAL SEA (see note X),*” and “*TERRITORIAL SEA AND CONTIGUOUS ZONE (see note X).*”

The text of note X differs slightly according to whether or not the natural resources boundaries of Puerto Rico or the gulf coast are shown. One version of this note is as follows:

“NOTE X

The 12-nautical mile territorial sea was established by Presidential Proclamation 5928, December 27, 1988, and is also the outer limit of the U.S. contiguous zone for the application of domestic law. The 3-nautical mile line, previously identified as the outer limit of the territorial sea, is retained because the proclamation states that it does not alter existing State or Federal law. The 9 nautical mile natural resources boundary off Texas, the Gulf coast of Florida, and Puerto Rico, and the 3 nautical mile line elsewhere remain the inner boundary of the Federal fisheries jurisdiction and the limit of states’ jurisdiction under the Submerged Lands Act (P.L. 83-31; 67 Stat.

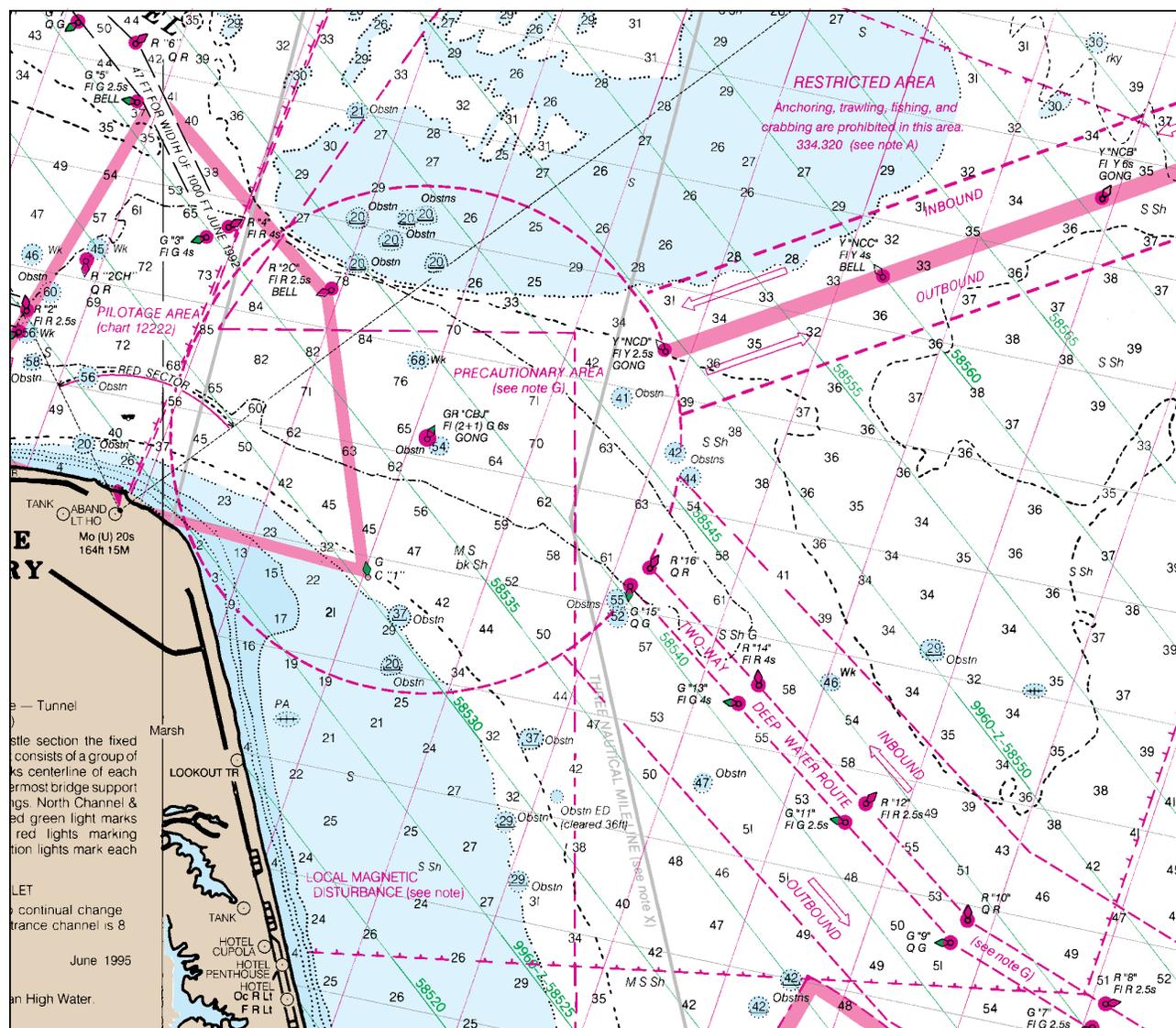


Fig. 7-6. Excerpt from NOS Chart No. 12221 (Chesapeake Bay Entrance) showing a variety of features of interest, including a traffic separation scheme and a Three-Mile Limit Line.

29, March 22, 1953). These maritime limits are subject to modification, as represented on future charts. The lines shown on the most recent chart edition take precedence.”

Figure 7–6 provides another excerpt from NOS Chart No. 12221 (Chesapeake Bay Entrance) showing a Three-Mile Limit Line among other features of interest.

Traffic Separation Schemes and Related Matters

TSS and *Vessel Traffic Services* (VTS) are related systems used to aid in the prevention of collisions in the approaches to many major harbors.⁶ Briefly, a TSS consists of a series of “highways in the water” that segregate traffic, while a VTS is a land-based system which provides advice and control of participating vessels in a manner similar to—but less elaborate than—the system employed for air traffic control. Centers for VTS have communications equipment and radar and optical systems for observation. TSS and VTS are discussed in 33 CFR Part 161 (Vessel Traffic Management) and 33 CFR Part 167 (Offshore Traffic Management Schemes). All vessels are obliged to follow Rule 10 (International Navigation Rules) regarding TSS, and there are specific rules and regulations (including whether participation in an associated VTS is voluntary or mandatory) applicable to each area. (Refer to the *U.S. Coast Pilot* or 33 CFR for details.)

A TSS is a routing measure designed to separate opposing streams of traffic by the establishment of traffic lanes. Vessels need not use a TSS (i.e., participation is voluntary). However, under Rule 10, paragraph (h), “...a vessel not using a traffic separation scheme shall avoid it by as wide a margin as is prac-

ticable.” A TSS may include traffic lanes, separation zones, roundabouts, precautionary areas, inshore traffic zones, deep-water routes, areas to be avoided, and (in the case of a corresponding VTS) calling-in points. It is convenient to include pilot boarding areas in this section. Definitions and charting practices are described below. Figures 7–7 and 7–8 provide excerpts from Chart No. 1 which illustrate many of the chart symbols used to depict TSS/VTS features. Figure 7–6 depicts a TSS in the vicinity of Chesapeake Bay, which includes traffic lanes, separation zones, and a precautionary area. This excerpt also shows a pilot boarding area.

A *traffic lane* means an area within defined limits in which one-way traffic is established. When joining or leaving a traffic lane (Rule 10 paragraph (b) (iii)) vessels are required to do so at as small an angle as possible. As far as practicable, vessels should avoid crossing traffic lanes (Rule 10 paragraph (c)). However, vessels crossing a traffic lane should do so on a heading as nearly as practicable at right angles to the lane. Vessels are encouraged to navigate at or near the center of the traffic lane. Otherwise (see Cockcroft and Lameijer),

⁶Although it is convenient to discuss TSS and VTS in the same section, as both relate to routing and employ similar charting conventions, it is important to distinguish between these two systems. A TSS is a set of “paper” conventions (routes) established by the host country in consultation with the *International Maritime Organization* (IMO). (The IMO (formerly IMCO) is an organ of the United Nations, based in London, England, established to deal with recommendations relative to maritime safety and pollution.) A TSS is the subject of Rule 10 of the International Navigation Rules. A VTS, however, is a physical entity, consisting of a control facility termed a *Vessel Traffic Center* (VTC), manned by personnel from the host country (principally the USCG in the United States, although a new private VTS has been commissioned in Los Angeles/Long Beach, CA, and others are planned for Tampa, FL, and Philadelphia, PA), communications facilities, and systems of observation (television cameras and radar) and operates in accord with published rules and regulations (CFR) under Rule 10 of the Inland Navigation Rules. Some major harbors and harbor approaches (e.g., New York) have a TSS and a VTS. Others (e.g., the approaches to the Chesapeake or Delaware Bays) have only a TSS. Yet others (typically those entirely within inland waters, e.g., the St Marys River) have a VTS, but no TSS (although routing regulations are published for this area). Finally, most harbors and harbor approaches have neither a TSS nor a VTS.

“...there is danger that a vessel which sets a course near the edge of a lane will stray into the separation zone or the traffic lane designated for traffic proceeding in the opposite direction.”

Vessels should also keep clear of the outer limit of the traffic lane lying on the vessel's starboard side,

“...particularly if this line separates the lane from an inshore zone which is likely to contain traffic moving in the opposite direction. On the edge of the lane two power-driven vessels meeting on reciprocal courses would each be required to alter course to starboard by Rule 14. Such action may cause both vessels to be involved in further meeting situations making it difficult for them to return to their correct lane or zone.”

Natural obstacles, including those forming separation zones may constitute a boundary. Traffic lanes are depicted in nautical charts by a distinctive symbol (M 13). Arrows are drawn to indicate the general direction of flow. If the traffic lane is wider than 5.0 mm at chart scale, the arrows are staggered within the lane. If not, arrows are placed in the center of the lane. A label “*INBOUND*,” or “*OUTBOUND*,” may be added in magenta capital italic type as shown in figure 7-6.

A *separation zone* or line means a zone or line which separates the ships proceeding in opposite or nearly opposite directions; or separating a traffic lane from the adjacent sea area; or separating traffic lanes designated for particular classes of ships proceeding in the same direction. Separation lines are represented by a magenta-screened

line at least 3 mm wide. Figure 7-6 shows a separation zone in the eastern inbound-outbound approach to Chesapeake Bay.

A *roundabout* is a routing measure comprising a separation point or circular separation zone and a circular traffic lane within defined limits. Traffic within the roundabout is separated by moving in a counterclockwise direction around the separation point or zone. A roundabout is depicted by a unique symbol (M 21, M d). As of this writing, there are no roundabouts in U.S. waters

A *precautionary area* means a routing measure comprising an area within defined limits where ships must navigate with particular caution and within which the direction of traffic flow may be recommended. A precautionary area is depicted by a unique symbol (M 16, M 24), and may include a label, “*PRECAUTIONARY AREA*,” in magenta italic capital letters. Figure 7-6 shows a precautionary area near the entrance to the Chesapeake Bay. Note that vessels not using the TSS may enter the precautionary area. In the TSS shown in figure 7-6, many vessels (e.g., recreational, tugs with barges, etc.) entering the Bay from the north or south along the coast—and not using the TSS—routinely enter this precautionary area.

A *deep-water route* is a route in a designated area within definite limits which has been accurately surveyed for clearance of sea bottom and submerged obstacles as indicated on the chart. A deep-water route may be either one-way or two-way. It is labeled, “*DEEP WATER ROUTE*,” or “*TWO-WAY DEEP WATER ROUTE*,” in magenta italic capital letters. Note the two-way deep-water route in the southern approach to Chesapeake Bay shown in figure 7-6.

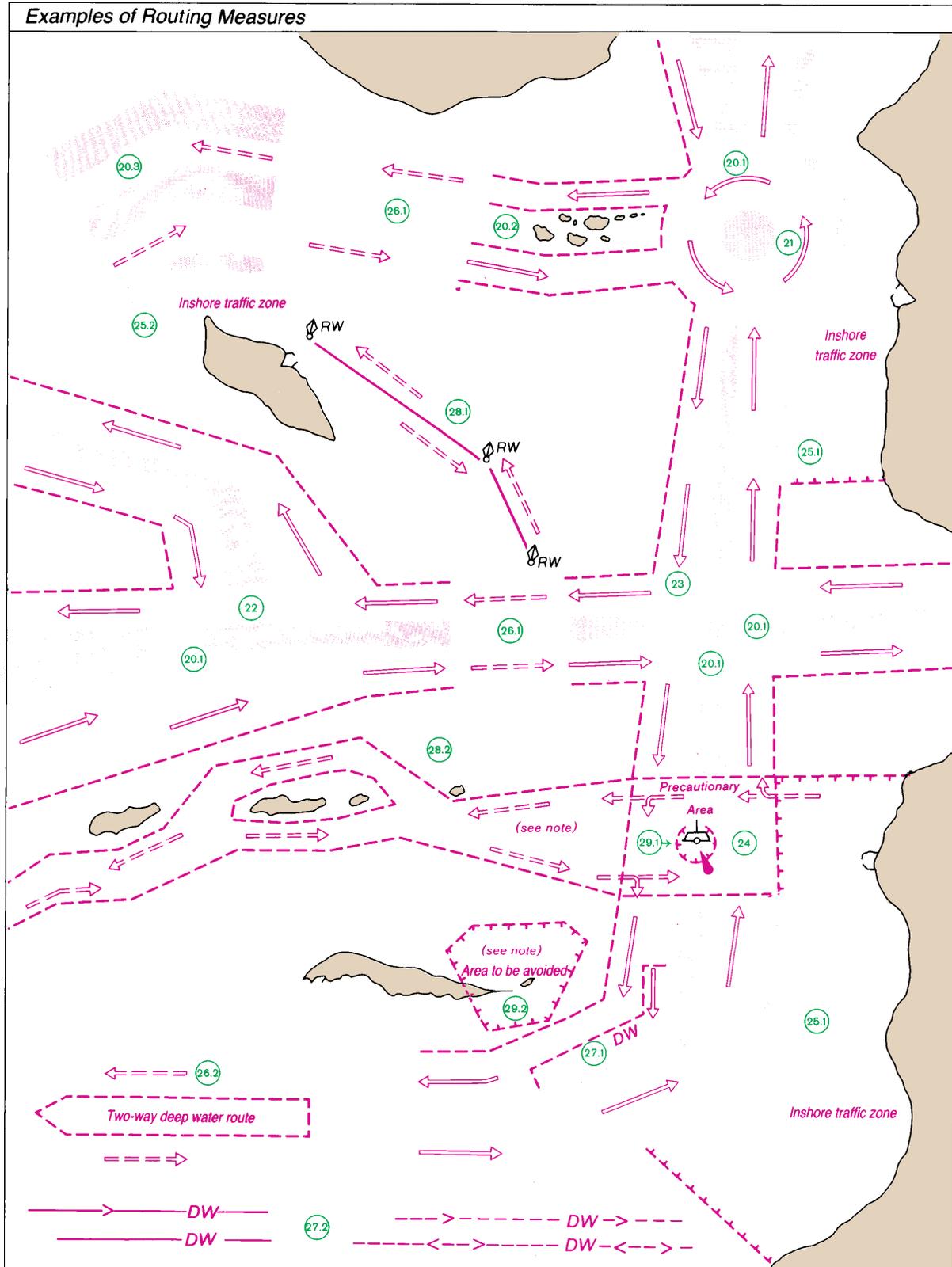


Fig. 7-7. Excerpt from Chart No. 1 Showing Charting Conventions for Routing Measures.

(20.1)	<i>Traffic separation scheme, traffic separated by separation zone</i>
(20.2)	<i>Traffic separation scheme, traffic separated by natural obstructions</i>
(20.3)	<i>Traffic separation scheme, with outer separation zone, separating traffic using scheme from traffic not using it</i>
(21)	<i>Traffic separation scheme, roundabout</i>
(22)	<i>Traffic separation scheme, with "crossing gates"</i>
(23)	<i>Traffic separation schemes crossing, without designated precautionary area</i>
(24)	<i>Precautionary area</i>
(25.1)	<i>Inshore traffic zone, with defined end-limits</i>
(25.2)	<i>Inshore traffic zone without defined end-limits</i>
(26.1)	<i>Recommended direction of traffic flow, between Traffic separation schemes</i>
(26.2)	<i>Recommended direction of traffic flow, for ships not needing a deep water route</i>
(27.1)	<i>Deep water route, as part of one-way traffic lane</i>
(27.2)	<i>Deep water route, centerline as recommended One-way or Two-way track</i>
(28.1)	<i>Recommended route (often marked by centerline buoys.)</i>
(28.2)	<i>Two-way route with one-way sections</i>
(29.1)	<i>Area to be avoided, around navigational aid</i>
(29.2)	<i>Area to be avoided, because of danger of stranding</i>

Fig. 7-8. Legend for Figure 7-7

An *inshore traffic zone* is a routing measure comprising a designated area between the landward boundary of a TSS and the adjacent coast, not normally to be used by through traffic (although under Rule 10 it may always be used by vessels under 20 meters in length and sailing vessels) and where special rules may apply. An inshore traffic zone must be explicitly designated, it is not simply the area between the boundary of the TSS and the land. It is labeled, “*INSHORE TRAFFIC ZONE*,” in magenta italics. It may have defined endpoints; if so, these are designated by T-shaped dashed magenta lines (identical to those used to depict a restricted area). Reference to figure 7–6 indicates that there is no inshore traffic zone established for this TSS, because there is no label “INSHORE TRAFFIC ZONE” included in the chart excerpt. (In fact, as of this writing, no inshore traffic zones have been established in U.S. waters.)

An *area to be avoided* is an area which is not recommended for navigation because of shoal hydrography, obstructions, or local and federal regulations. These areas are denoted with a unique symbol (M 29.1, M 29.2). For example (IMO), off the coasts of the United States there are areas to be avoided in the vicinity of the Louisiana Offshore Oil Port (safety concerns near the platform pumping complex and single point mooring buoys), in the region of Nantucket Shoals (because of the great danger of strandings and for environmental protection), in the region of the Northwest Hawaiian (Sandwich) Islands (to avoid the risk of pollution in a designated wildlife refuge), off the California coast near the Channel Islands National Marine Sanctuary (pollution concerns), and throughout the Florida Keys (to avoid risk of pollution and

damage to the environment).

Calling-in points, requiring participating vessels to report to a traffic control center, have been established in certain waterways and port approaches (e.g., the New York Vessel Traffic Service, the Berwick Bay Vessel Traffic Service, etc.) to assist in traffic control. (Refer to the appropriate rules and regulations published in the CFR for details.) Where established, calling-in (reporting) points are denoted on the nautical chart by a unique magenta symbol (M 40) consisting of a circle enclosing an alphanumeric designator with one or two arrowheads attached. The alphanumeric designator corresponds to a calling-in point given in the CFR. (Generally numeric or alphanumeric designators indicate mandatory calling-in points, while alphabetic designators depict voluntary calling-in points.) The arrowhead(s) indicate that position reports are required for vessels bound in one or two directions. Whenever numeric or alphanumeric designators are charted, the following note is added in light magenta type:

“Vessel Traffic Services calling-in point with numbers; arrow indicates direction of vessel movement.”

Pilot boarding areas denote meeting or boarding places where vessels pick up or disembark pilots. (Discussions on pilotage regulations can be found in the *Coast Pilot Manual*, appendix B, and in the CFR.) The limits of pilot areas are usually charted with a 2.5 mm magenta-screened band, or a magenta symbol (T 1.1) if the chart scale is too small to show the area. These areas are labeled “*PILOT BOARDING AREA*,” or (as shown in figure 7–6), “*PILOT-AGE AREA*,” in magenta italic type. A pilot boarding area is not part of a TSS, but is included in the section because pilot boarding areas are often located near elements of a TSS.

-Notes

All TSS are described in the applicable *U.S. Coast Pilot*. But, as of this writing, not all TSS are described in the CFR. A note is added on the nautical chart which provides additional information on any TSS not described in the CFR. The exact text of the note varies with the TSS, but the following serves as an illustration.

**“NOTE G
TRAFFIC SEPARATION SCHEME**

One-way traffic lanes overprinted on this chart are RECOMMENDED for use by all vessels traveling between the points involved. They have been designed to aid in the prevention of collisions at the approaches to major harbors and along heavily traveled coastal waters, but are not intended in any way to supersede or to alter the applicable Rules of the Road. Separation zones are intended to separate inbound and outbound traffic and to be free of ship traffic. Separation zones should not be used except for crossing purposes. When crossing traffic lanes and separation zones use extreme caution. A Precautionary Area has been established at San Pedro Bay. It is recommended that vessels proceed with caution in this area.”

This note is “customized” as appropriate to each TSS and is removed upon inclusion of the TSS in the CFR.

-Additional Information

Additional information regarding any TSS or VTS in U.S. waters can be found in the *U.S. Coast Pilot*. The following excerpt from the *U.S. Coast Pilot*, for example, provides information on the TSS shown in figure 7-6:

“Traffic Separation Schemes (Chesapeake Bay Entrance and Smith Point) have been established for the control of maritime traffic at the entrance of Chesapeake Bay and off

Smith Point Light (37°52.8’N., 76°11.0’W.). They have been designed to aid in the prevention of collisions, but are not intended in any way to supersede or alter the applicable Navigation Rules. (See Traffic Separation Schemes, Chapter 1, for additional information.)

“(30) Traffic Separation Scheme (Chesapeake Bay Entrance).—The scheme provides for inbound outbound traffic lanes to enter or depart Chesapeake Bay from the northeastward and from the southeastward. (See NOS chart 12221.)

“(31) A precautionary area with a radius of 2 miles is centered on Chesapeake Bay Entrance Junction Lighted Gong Buoy CBJ (36°56.1’N., 75°57.5’W.).

“(32) The northeastern inbound/outbound traffic lanes are separated by a line of four fairway buoys on bearing 250°–070°. The outermost buoy in the line is 6.4 miles 313° from Chesapeake Light and the innermost buoy is 4.5 miles 074° from Cape Henry Light.

“(33) The southeastern approach is marked by Chesapeake Bay Southern Approach Lighted Whistle Buoy CB (36°49.0’N., 75°45.6’W.). A RACON is on the buoy. The inbound/outbound traffic lanes are separated by a **Deep-Water Route** marked by lighted buoys on bearings 302°–122° and 317°–137°. The Deep-Water Route is intended for deep draft vessels and naval aircraft carriers entering or departing Chesapeake Bay. A vessel using the Deep-Water Route is advised to announce its intentions on VHF–FM channel 16 as it approaches Lighted Whistle Buoy CB on the south end, and Lighted Gong Buoy CBJ on the north end of the route. All other vessels approaching the Chesapeake Bay Traffic Separation Scheme should use the appropriate in-

bound/outbound lanes of the northeasterly or southeasterly approaches.

“(34) The Coast Guard advises that upon entering the traffic lanes, all inbound vessels are encouraged to make a security broadcast on VHF–FM channel 13, announcing the vessel’s name, location, and intentions.

“(35) **Exercise extreme caution where the two routes converge off Cape Henry.** Mariners are also warned that vessels may be maneuvering in the pilotage area which extends into the western part of the precautionary area.”

Additional material on TSS can also be found in other publications (e.g., IMO).

–Relevance to the Mariner

TSS/VTS have been established to promote the safe and expeditious flow of traffic. Whether voluntary or mandatory, participation by all vessels operating in the vicinity of a TSS is desirable. The introduction of the TSS has been hailed as a significant “breakthrough” in reducing the incidence of collisions. As Cahill (*Strandings and Their Causes*) noted:

“The most effective way of achieving a reduction in ship casualties is through reduction of the risks to which mariners are exposed. A dramatic and conclusive example of the truth of this proposition is before us in the results achieved by the introduction of traffic separation schemes; specifically that in the Dover Strait. That scheme is arguably the most significant contribution to ship safety since the introduction of steam propulsion.”

For a more critical view of VTS specifically, see Young.

Including TSS information on the nautical chart certainly simplifies compliance with the routing instructions.

However, participating vessels should be aware that some vessels (either because they choose not to participate or because they fail to read and understand the procedures) will not follow the charted patterns. When transiting these, as well as other areas, caution is the watchword. As noted in one of the standard reference works (Farwell’s):

“Even with up-to-date charts there remain instances of ships proceeding contrary to the direction of traffic flow laid down for traffic separation schemes. Where collisions have occurred, the courts have been consistent in finding that, despite the rogue vessel’s contravention of International Regulations... the other rules of the collision regulations applied in all respects.”

There have been numerous instances of collisions with “rogue” vessels in areas with established routes (see Cahill, *Collisions and Their Causes*, or Holdert and Buzek), but perhaps the most famous was the *Andrea Doria-Stockholm* collision in 1956 (see Marriott or Hoffer).⁷

–Smaller Vessels

In the days before the “electronic revolution,” some might have argued that it was a challenge for operators of smaller vessels (e.g., recreational or small fishing vessels) to comply fully with an established TSS—particularly in areas sufficiently far offshore to prevent visual fixes being taken on land-based objects and/or for a TSS that is not well marked by *aids to navigation* (ATONs). Opting for an inshore route might have been preferable to attempting to use the lanes without suitable means for fixing the vessel’s position.

⁷This did not involve a TSS *per se*, but rather ignoring the 1948 *Safety of Life at Sea* (SOLAS) recommendation on traffic separation—a precursor to today’s TSS.

Now, however, it is common for even small vessels to have LORAN-C or GPS receivers on board. Use of these electronic aids greatly simplifies compliance with the established TSS, regardless of the prevailing visibility. The traffic lanes can be identified by a sequence of waypoints (defining the center of linear portions of the lanes), and the “off course” alarm feature common to most of these receivers can be set so that the operator is warned if the vessel strays from the charted traffic lane.⁸ Waypoints can also be used to mark calling-in points for a VTS.

Rule 10, paragraph (e) (ii), permits fishing within a separation zone of a TSS. The “off course” alarm feature of most modern LORAN-C or GPS receivers can also be used to warn the operator if the fishing vessel wanders out of the designated separation zone.

Some final tips relevant to use of a TSS include:

Expect to find a significant amount of traffic in a TSS. These lanes concentrate traffic from a wide ocean area, so that traffic densities can be quite high. Vessels should maintain an alert lookout (both visual and with radar if so equipped).

Ensure that your vessel is equipped with a radio if using a TSS. This enables you to communicate with other vessels using the TSS. A radio is essential if using a VTS.

Equip your vessel with a radar reflector if operating in a TSS and your vessel is not radar conspicuous. Recreational vessels, in particular, are often difficult to “see” on radar.

A deep-water route is primarily intended to be used by deep-draft ships. Vessels not requiring such channel depths should avoid using these routes to limit traffic congestion.

When feasible, sailing vessels are probably well advised to remain well clear of a TSS. The slow speed and restricted maneuverability of a sailing vessel could create a collision hazard.

Read Rule 10 of the International Navigation Rules carefully before attempting to use a TSS. A TSS is no place for the ill-informed or naïve mariner.

Course Lines

Some Great Lakes charts show course lines that are unofficial traffic separation scheme devised by shipping interests for their own benefit. These course lines have not been established by the USCG, nor are regulations published in the CFR.

These course lines are charted with a black dashed line on charts with English units and magenta dashed line on metric charts. In either case, the labels for the course lines are shown in magenta. The labels include distance (in statute and nautical miles) and bearings along a course. The point where a course changes direction is shown with a black dashed line to a point of land or object ashore. The bearing of the line and the distance offshore of the turning point are included in a black label along the dashed line.

If course lines are shown, the following sailing directions note (in black vertical letters) is included on Great Lakes metric charts with Mercator projections:

⁸It is recommended that the off-course alarm be set up to warn the mariner well before the limits of the traffic lane so as to allow an ample margin of safety.

“SAILING DIRECTIONS.

Bearings on sailing courses are true and distances given thereon are in statute miles (St M) and nautical miles (NM) between points of departure. The true bearing between any two points on this chart may be determined by connecting the two points with a straight line and measuring the angle of the intersection with a meridian line.”

This note is included in the group of notes aligned under the chart title.

Courses

Courses, also called *tracks*, are a feature included on some nautical charts. Courses/tracks are usually shown in rivers, bays, and other inshore waters and are intended primarily to help mariners avoid shoal depths rather than to regulate shipping movement. The decision whether or not to follow a charted course is left to the discretion of the mariner rather than a matter of regulation—although some courses are charted in connection with a TSS.

Bearings charted along courses are given in degrees and tenths of a degree with respect to true (not magnetic) north. Reciprocal bearings are charted along two-way courses.

Distances along courses may also be charted (in statute or nautical miles). Distances may also be shown as a series of mileage

“ticks.” These ticks are generally charted (in magenta) in statute miles at 1-mile or 5-mile intervals depending upon the scale of the chart.

Recommended courses marked by fixed or floating ATONs (M 3) are charted with a solid black line. Traffic flow directional arrows may be inserted at regular intervals along the line.

Recommended courses not marked by ATONs (M 4) are charted with a dashed magenta line.

An alternate course (M c) is a secondary course available to shallower draft vessels. Usually an alternate course will rejoin the recommended course. The alternate course is charted with a dashed magenta line whether or not it is marked by ATONs. Arrows are used to indicate the direction of traffic flow if so recommended.

Concluding Comments

The material in this chapter is quite detailed. Although nearly all the topics discussed have regulatory significance, knowledge of the various areas, limits, routes, and tracks, and how these are depicted on the nautical chart is also very important to the mariner to ensure safe passage.

A study of collateral information, such as the CFR or the *U.S. Coast Pilot*, is particularly important with respect to the charted features discussed in this chapter. Charted features, for the most part, are there to alert the mariner to applicable rules and regulations and/or potential hazards.

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“The greatest hazard to navigation is a bored navigator.”

Anonymous, quoted in Schlereth

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